List of Claims:

Claims 1-15 (Cancelled)

Claim 16 (Currently Amended): A method of generating digital images having improved dynamic range comprising:

collecting a charge in a photodetector by exposing the photodetector with photons for a first predetermined period of time;

comparing the charge to a predetermined value;

if the charge is greater than or equal to the predetermined value, normalizing ~~storing~~ a digital voltage value corresponding to the charge to generate a normalized voltage value and storing the normalized voltage value; and

if the charge is less than the predetermined value, collecting additional charge in the photodetector by re-exposing the photodetector for a new period of time.

Claim 17 (Original): The method of claim 16 further including non-destructively reading the charge.

Claims 18-19 (Cancelled)

Claim 20 (Currently Amended): The method of claim ~~19~~ 16 wherein the step of storing further comprises storing the normalized voltage value in a location in a frame memory.

Claim 21 (Original): The method of claim 20 further including clearing the location in the frame memory before collecting the charge.

Claim 22 (Original): The method of claim 21 wherein the step of storing the normalized voltage value in the location in the frame memory comprises storing the normalized voltage value in the location in the frame memory only if the location in the frame memory is blank.

Claim 23 (Currently Amended): The method of claim ~~22~~ 16 further including incrementing an index number before collecting additional charge in the photodetector.

Claim 24 (Currently Amended): The method of claim ~~23~~ 16 wherein the normalizing step comprises shifting the digital voltage value to the right by a predetermined number of bits.

Claim 25 (Currently Amended): The method of claim ~~24~~ 16 wherein the normalizing step comprises shifting the digital voltage value to the right by a number of bits equal to the index number.

Claim 26 (Currently Amended): The method of claim ~~25~~ 16 further including, prior to the step of storing the normalized voltage value, determining if the charge is less than the predetermined value, and if the index number is greater than a predetermined index value.

Claim 27 (Currently Amended): The method of claim ~~25~~ 16 further including, prior to the step of storing the normalized voltage value, determining if the charge is less than the predetermined value, and if the index number is greater than a width of the location in the frame memory.

Claim 28 (Currently Amended): The method of claim ~~19~~ 16 wherein the step of collecting additional charge comprises re-exposing the photodetector with photons for a period of time equal to

$$x*2^{(N-1)}$$

where x is equal to the first predetermined period of time and N is equal to the index number.

Claims 29-32 (Cancelled)

Claim 33 (Currently Amended): A system for generating digital images having improved dynamic range comprising:

means for collecting a charge in a photodetector by exposing the photodetector with photons for a first predetermined period of time;

means for comparing the charge to a predetermined value;

means for ~~storing~~ normalizing a digital voltage value corresponding to the charge to generate a normalized voltage value if the charge is greater than or equal to the predetermined value; ~~and~~

means for storing the normalized voltage value; and

means for collecting additional charge in the photodetector by re-exposing the photodetector for a new period of time if the charge is less than the predetermined value.

Claim 34 (Original): The system of claim 33 further including means for non-destructively reading the charge.

Claim 35 (Cancelled)

Claim 36 (New): The system of claim 33 wherein the means for storing further comprises means for storing the normalized voltage value in a location in a frame memory.

Claim 37 (New): The system of claim 36 wherein the location in the frame memory is cleared before collecting the charge.

Claim 38 (New): The system of claim 37 wherein the means for storing the normalized voltage value in the location in the frame memory stores the normalized voltage value in the location in the frame memory only if the location in the frame memory is blank.

Claim 39 (New): The system of claim 33 further including means for incrementing an index number before collecting additional charge in the photodetector.

Claim 40 (New): The system of claim 33 wherein the means for normalizing comprises means for shifting the digital voltage value to the right by a predetermined number of bits.

Claim 41 (New): The system of claim 33 wherein the means for normalizing comprises means for shifting the digital voltage value to the right by a number of bits equal to the index number.

Claim 42 (New): The system of claim 33 further including means for determining if the charge is less than the predetermined value, and if the index number is greater than a predetermined index value, prior to storing the normalized voltage value.

Claim 43 (New): The system of claim 33 further including means for determining if the charge is less than the predetermined value, and if the index number is greater than a width of the location in the frame memory, prior to storing the normalized voltage value.

Claim 44 (New): The system of claim 33 wherein the means for collecting additional charge comprises means for re-exposing the photodetector with photons for a period of time equal to

$$x*2^{(N-1)}$$

where x is equal to the first predetermined period of time and N is equal to the index number.

Claim 45 (New): A system for generating digital images having improved dynamic range comprising:

a photodetector configured to collect a charge in by being exposed to photons for a first predetermined period of time;

a comparator configured to compare the charge to a predetermined value;

a normalizer configured to normalize a digital voltage value corresponding to the charge to generate a normalized voltage value if the charge is greater than or equal to the predetermined value;

a memory configured to store the normalized voltage value; and

wherein the photodetector collects additional charge by being re-exposed for a new period of time if the charge is less than the predetermined value.

Claim 46 (New): The system of claim 45 further including a non-destructive charge reader.

Claim 47 (New): The system of claim 45 wherein the memory is a location in a frame memory.

Claim 48 (New): The system of claim 47 wherein the location in the frame memory is cleared before collecting the charge.

Claim 49 (New): The system of claim 48 wherein the normalized voltage value is stored in the location in the frame memory only if the location in the frame memory is blank.

Claim 50 (New): The system of claim 45, wherein an index number is incremented before collecting additional charge in the photodetector.

Claim 51 (New): The system of claim 45 wherein the normalizer shifts the digital voltage

value to the right by a predetermined number of bits.

Claim 52 (New): The system of claim 45 wherein the normalizer shifts the digital voltage value to the right by a number of bits equal to the index number.

Claim 53 (New): The system of claim 45, wherein prior to storing the normalized voltage value, the system determines if the charge is less than the predetermined value, and if the index number is greater than a predetermined index value.

Claim 54 (New): The system of claim 45 wherein prior to storing the normalized voltage value, the system determines if the charge is less than the predetermined value, and if the index number is greater than a width of the location in the frame memory.

Claim 55 (New): The system of claim 45 wherein the photodetector collects the additional charge by being re-exposed to photons for a period of time equal to

$x*2^{(N-1)}$

where x is equal to the first predetermined period of time and N is equal to the index number.